09/995,128

1. (CURRENTLY AMENDED) A method for obtaining a measurement value of a three-dimensional shape of an object, using a grid image formed by projecting a plurality of grid patterns upon the object to be measured, the method comprising the steps of:

providing a plurality of one-dimensional grids of different colors, with each one of the plurality of one-dimensional grids of different colors having a different rotation angle from another;

projecting the grid patterns, from the plurality of one-dimensional grids of different colors, upon the object to be measured~~, the grid patterns comprising a plurality of one-dimensional grids of different colors, each having a distinctive period and direction~~;

imaging the grid patterns deformed in accordance with the three-dimensional shape of the object to be measured;

separating from the grid image each of the one-dimensional grids of different colors;

detecting a phase for each of the one-dimensional grids; and

obtaining the measurement value on the basis of the detected phases.

2. (PREVIOUSLY PRESENTED) The method for obtaining a measurement value of a three-dimensional shape of an object as recited in claim 1, wherein the colors of the one-dimensional grids of different colors are red, green and blue.

3. (PREVIOUSLY PRESENTED) The method for obtaining a measurement value of a three-dimensional shape of an object as recited in claim 2, wherein the colors of the one-dimensional grids of different colors are projected through a plurality of prism mechanisms by a plurality of white light sources.

4. (PREVIOUSLY PRESENTED) The method for obtaining a measurement value of a three-dimensional shape of an object as recited in claim 2, wherein the grid patterns comprise dots.

5. (PREVIOUSLY PRESENTED) The method for obtaining a measurement value of a three-dimensional shape of an object as recited in claim 1, wherein the grid patterns comprise sinusoidal lines.

6. (PREVIOUSLY PRESENTED) The method for obtaining a measurement value of a three-dimensional shape of an object as recited in claim 1, wherein a straight line connecting a center of a projection lens which projects the grid patterns with a

center of an image formation lens which senses the images of the grid patterns is parallel to a reference surface on which the object to be measured is placed.

7. (PREVIOUSLY PRESENTED) The method for obtaining a measurement value of a three-dimensional shape of an object as recited in claim 6, wherein an optical axis of the image formation lens is perpendicular to the reference surface.

8. (PREVIOUSLY PRESENTED) The method for obtaining a measurement value of a three-dimensional shape of an object as recited in claim 1, further comprising the step of measuring color information of the object to be measured by imaging the object using white light.

9. (PREVIOUSLY PRESENTED) The method for obtaining a measurement value of a three-dimensional shape of an object as recited in claim 1, wherein the phases for each of the one-dimensional grids have periods that when compared to each other have ratios represented by prime numbers.

10. (PREVIOUSLY PRESENTED) The method for obtaining a measurement value of a three-dimensional shape of an object as recited in claim 9, wherein a measurement sensitivity ratio for transforming a height of the object into a phase value is determined from a periodic ratio in a horizontal direction of the one-dimensional grids.

11. (CURRENTLY AMENDED) The method for obtaining a measurement value of a three-dimensional shape of an object, using a grid image formed by projecting a plurality of grid patterns upon the object to be measured, the method comprising the steps of:

providing at least three one-dimensional grids of different colors, with each one of the at least three one-dimensional grids of different colors having a different rotation angle from another;

projecting the grid patterns, from the at least three one-dimensional grids of different colors, upon the object to be measured~~, the grid patterns comprising at least three one-dimensional grids of different colors, each having a distinctive period and direction~~;

imaging the grid patterns deformed in accordance with the three-dimensional shape of the object to be measured;

separating from the grid image each ~~[[of the]]~~ one-dimensional grid component~~[[s]]~~ of different colors;

obtaining an intensity distribution of spatial frequency spectrums through Fourier-transformation;

selectively extracting spectral components corresponding to the spatial frequency spectrums by means of a spatial frequency filter;

performing an inverse two-dimensional Fourier transform on the selected spectral component;

detecting a phase for each of the one-dimensional grid components; and

obtaining the measurement value on the basis of the detected phases.

12. (CURRENTLY AMENDED) A method for obtaining a measurement value of a three-dimensional shape of an object, using a grid image formed by projecting a plurality of grid patterns upon the object to be measured, the method comprising the steps of:

providing at least three one-dimensional grids of different colors, with each one of the at least three one-dimensional grids of different colors having a different rotation angle from another;

projecting the grid patterns, from the at least three one-dimensional grids of different colors, upon the object to be measured, ~~the grid patterns comprising at least three one-dimensional grids of different colors, each having a distinctive period and direction~~;

imaging the grid patterns deformed in accordance with the three-dimensional shape of the object to be measured;

separating from the grid image each ~~[[of the]]~~ one-dimensional grid component~~[[s]]~~ of different colors;

extracting, selectively, through a two-dimensional filter window function a desired spectrum and inversely Fourier transforming the spectrum to obtain a two-dimensional impulse response function;

carrying out a direct, two-dimensional convolution operation on the two-dimensional impulse response function to obtain spectral components corresponding to the one-dimensional grid components;

detecting a phase for each of the one-dimensional grid components; and

obtaining the measurement value on the basis of the detected phases.